

REMARKS

Review and reconsideration on the merits are requested.

Claims 1-5 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. 2002/0134674 to Andrews et al.

Andrews et al was cited as disclosing an anodic electrode including an EBONEX substrate and a suitable catalyst layer selected from α -lead dioxide, β -lead dioxide, boron-doped diamond, platinum-tungsten alloys or mixtures, glassy carbon, fluorinated graphite and platinum ([paragraph 0051]). Although acknowledging that Andrews et al does not specifically disclose a mixture of conductive diamond and Magneli powder, the Examiner considered that such mixture would *inherently* (i.e., necessarily) form when the coating of conductive diamond is applied to the Magneli powders of the substrate. The Examiner further considered that the recitation of claims 2 and 4 is also *inherently* met because the same materials (in Andrews et al) are used in making the electrode.

In response, claims 1 and 3 have been amended to incorporate the recitation of claims 2 and 4, respectively, to thereby require a minimum 5% volume ratio of Magneli phase titanium oxide powder. Claims 2, 4 and 5 have been canceled. The subject claim amendment patentably distinguishes over the cited prior art for the following reasons.

Claim 1 reads on Fig. 2 of the specification, where a mixture of diamond powder and Magneli phase titanium oxide powder is spread on a slurry of a Magneli phase titanium oxide powder previously charged in a container of a pressing device and then molded under pressure followed by sintering (Example 2 at page 14 of the specification). On the other hand, claim 3

reads on the embodiment of Fig. 1, where a slurry containing a mixture of diamond powder and Magneli phase titanium oxide powder is spread on a previously formed Magneli phase titanium oxide plate, followed by pressing and then sintering.

Andrews et al surely discloses an anodic electrode including a boron-doped diamond catalyst layer disposed on EBONEX, namely an electrode containing Magneli phase titanium oxide as an electrode composition.

The Examiner's position was that disposing boron-doped diamond as a catalyst layer on a porous substrate comprising EBONEX would result in a catalyst layer containing both boron-doped diamond and Magneli phase titanium oxide. However, it is not clear at all that such would be the case. Moreover, it is not at all clear that the resulting catalyst layer would contain a minimum 5% volume ratio of Magneli phase titanium oxide powder as required by amended claims 1 and 3.

Firstly, Andrews et al does not disclose how the boron-doped diamond might be disposed as a catalyst layer on EBONEX. Assuming *arguendo* that such method could be CVD, the substrate would be maintained at a high temperature and in a reducing atmosphere. Under these conditions, EBONEX is rather stable and it is not possible to introduce Magneli phase titanium oxide into a diamond catalyst layer in a volume ratio of at least 5% as required by the amended claims. Moreover, a technique of forming a diamond catalyst layer on EBONEX by sintering or pressing of a powder material is not known in the electrochemical field. That is, Applicants respectfully dispute the Examiner's assertion that simply forming a boron-doped diamond

catalyst layer on EBONEX would introduce Magneli phase titanium oxide in an amount of at least 5 vol%.

On the other hand, Applicants comment on the significance of incorporating at least 5 vol% Magneli phase titanium oxide into the catalyst layer, with reference to the specification as follows.

For example, as described bridging pages 7-8 of the specification, in an electrode in which a slurry containing diamond particles is coated on the substrate surface and then baked to form a diamond layer as a catalyst, adhesion of the Magneli phase titanium oxide substrate to the diamond particles is insufficient. Diamond particles on the substrate surface drop out of the substrate during electrolysis, often resulting in an increase in voltage. However, by including Magneli phase titanium oxide in the slurry forming the catalyst layer, the holding force of the diamond powder in the sintered catalyst layer is enhanced. See also page 9, lines 18-25 of the specification.

Moreover, there is nothing in Andrews et al which teaches how to make an electrode including a catalyst layer containing both conductive diamond and Magneli phase titanium oxide powder in an amount of at least 5 vol%. For instance, the working examples of Andrews et al relate to electrodes in the form of β -lead dioxide-coated sintered porous titanium substrates which have nothing to do with the subject matter of the present invention. Thus, Andrews et al fundamentally is not an enabling reference.

For the above reasons, it is respectfully submitted that amended claims 1 and 3 define novel subject matter, and withdrawal of the foregoing rejection under 35 U.S.C. § 102(b) is respectfully requested.

Claims 1-5 were rejected under 35 U.S.C. § 102(b) as being anticipated by EP 1 489 200 A1 to Shimamume (EP '200).

In response, EP '200 published December 22, 2004 *subsequent to* the April 14, 2004 U.S. filing date of the present application is not prior art against the present claims under any subsection of 35 U.S.C. § 102.

Withdrawal of the foregoing rejection is respectfully requested.

New claims 6-16, including independent claims 8, 11 and 14 are presented for examination. Product-by-process claims 8 and 14 read on Example 2 of the specification, whereas product-by-process claim 11 reads on Example 1 of the specification. Claims 9 and 10 depending from claim 8, claim 12 depending from claim 11 and claims 15 and 16 depending from claim 14 further characterize the content of the Magneli titanium oxide powder in the electrode catalyst (either as a volume ratio of the conductive diamond powder to the Magneli phase titanium oxide powder, or in terms of vol%).

Withdrawal of all rejections and allowance of claims 1, 3 and 6-16 is earnestly solicited.

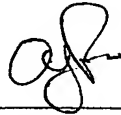
In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No. 10/823,752

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Respectfully submitted,



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